

In the claims:

Kindly amend the claims as follows:

1. (Currently Amended) A pretreatment process for solid lump feed material for a gas and pellet/lump-based shaft furnace direct reduction process processes, comprising:

preheating lump feed material to a temperature of from about 200°C 200°C to about 500°C 500°C, without reduction, in a non-reducing atmosphere prior to charging the feed material to gas-based direct reduction furnace; and

increasing the temperature of the preheated feed material within the furnace from the material introduction temperature to about 750 °C within the first 20 minutes of charging the feed material into the furnace;

thereby whereby minimizing the formation of fines within the furnace is minimized.

2. (Currently Amended) A process according to claim 1, wherein the feed material is preheated to a temperature of about 200°C 200°C to 425°C 425°C.

3. (Currently Amended) A process according to claim 1, wherein said preheating is accomplished in a feed storage bin by introduction of waste off-gases at a sufficient temperature to heat the feed material in the storage bin.

4. (Currently amended) A process according to claim 3 wherein the waste off-gas temperature is in excess of 500°C 500°C upon introduction into the feed storage bin.

5. (Original) A process according to claim 3, wherein said waste off-gases are removed from a reformer associated with the direct reduction process.

6. (Currently Amended) Apparatus for preheating feed material to a direct reduction shaft furnace, comprising:

a shaft furnace having an upper feeding and heating portion, a middle gas feeding and reducing portion, and a lower product discharge portion;

means for removing hot gas from the furnace;

reformer means for reforming removed off-gas, including means for heating the reformer by combustion of gas, and means for removing waste combusted off-gas from the heating of the reformer;

a feed material storage bin, said means for removing waste off-gas communicating with said storage bin for heating the contents thereof; and

means for transporting the heated feed material to the furnace and for charging the heated feed material into the shaft furnace for reduction.

7. (Original) Apparatus according to claim 6 wherein said feed storage bin is enclosed, and said means for transporting the heated feed material to the furnace is insulated.

Add the following new claim:

8. (New) A pretreatment process for solid lump feed material ~~for~~ gas and pellet/lump-based shaft furnace direct reduction process comprising:

preheating lump feed material to a temperature of from about 200°C to about 500°C, without reduction, in a non-reducing atmosphere prior to charging the feed material to gas-based direct reduction furnace; and

increasing the temperature of the preheated feed material within the furnace from the material introduction temperature to about 750°C while the feed material descends the first half meter in the furnace after introduction of the feed material into the moving bed of the furnace;

whereby the formation of fines within the furnace is minimized.